PROJECT TITLE	:	CIGARETTE DEVELOPMENT 2
PERIOD COVERED	:	DECEMBER 9, 1981 - JANUARY 11, 1982
WRITTEN BY	:	Frattolillo-A.

208 TENNIS UK BLENDING OF CUT-FILLERS

This is a summary of the work which has been done on the hand-blended cut-fillers produced in different ratios, with the intention of obtaining an index of the quality and regularity of the final product and to evaluate the feasibility of such a method on an industrial scale.

Objective

The development of intermediary products, i.e. cigarette prototypes, by means of cut-filler blending, for the gradual introduction of the Pan-European MARLBORO in the UK.

Description of samples and results

For the purpose, a non-cased tobacco cut-filler under blend No GB0120803N02 used for prototype No 23 T (first step) and a fully cased tobacco cut-filler under blend No GB0120804N02 used for prototype No 53 T (final step), were used. The differences between the two blends are presented below :

PROTOTYPE NO 23 T TOBACCO BLEND NO GB0120803N02	PROTOTYPE NO 53 T TOBACCO BLEND NO GB0120804N02
COMPOSITION	COMPOSITION
7.0 % Esther	7.3 % Esther
11.0 % LTR UK	19.3 % RL UK
26.5 % FC (US)	24.5 % FC (US)
20.0 % FC	6.8 % FC
16.5 % Burley (US)	17.9 % Burley (US)
8.0 % Burley	9.7 % Burley
11.0 % Oriental	14.5 % Oriental
TREATMENTS	TREATMENTS
EAC-69	EAC-46
No casings	Fully cased
No flavoured filter	No flavoured filter

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The two cut-fillers above were hand-blended in three ratios i.e. 25:75; 50:50 and 75:25. The cut-fillers thus obtained were then incorporated in the Pan-European MARLBORO construction. At the same time, control cigarettes were produced by using separately the 100 % cut-fillers of the two prototypes.
The physical and chemical results of the produced prototypes are shown in the table on the next page, where the numbers in brackets indicate the already described 100 % tobacco filler of prototypes 23 T and 53 T respectively.

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PROJECT NAME : TENNIS | PROJECT NO : 208 | PROJECT LEADER : ANF | DATE : 01.18.1982

PROTOTYPE NO		60 P	61 P	62 P	63 P	64 P
FILLER COMBINATIONS		100 % (23 T)	75 % (23 T) 25 % (53 T)	50 % (23 T) 50 % (53 T)	25 % (23 T) 75 % (53 T)	100 % (53 T)
CIGARETTE CHARACTERISTICS						
Format	mm	7.95 / 20 / 84				
Cigarette paper		Wattens 60				
Tipping paper		Z3 / 60				
Plug-wrap		FU-POV 24 L				
Filter		3.4 I / 46				
Total cigarette weight	mg/cig.	974	1002	1021	1042	1050
Tobacco weight	mg/cig.	753	777	794	813	830
Total RTD	mm WG	101	110	113	112	107
Filter RTD	mm WG	63	70	74	71	67
Dilution	%	16	16	16	17	18
Filler density at 12 % M	mg/ml	239	245	251	254	258
Compressibility at 12 % M	mm	3.47	3.46	3.32	3.28	3.12
FILLER CHARACTERISTICS						
Total alcaloids	%	1.86	1.92	1.90	1.88	1.91
Reducing sugars	%	10.2	9.7	9.0	7.9	8.8
Nitrate-Nitrogen	%	0.16	0.20	0.25	0.26	0.26
SMOKE ANALYSES						
TAR	mg/cig.	14.2	14.1	13.5	13.5	15.2
DPM	mg/cig.	15.4	15.3	14.6	14.6	16.3
SN	mg/cig.	1.19	1.17	1.10	1.09	1.14
CO	mg/cig.	14.8	14.6	14.4	14.7	15.8
NO	mg/cig.	0.18	0.18	0.20	0.22	0.25
Puff count		8.5	8.5	8.6	9.1	9.4

COMMENTS :

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Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000

Among these prototypes, Panel A commented on :

Prototype 60 P : Uniform in taste, clean, soft, but lacking some impact, especially at the beginning.

Prototype 62 P : Clean in taste, but lacking impact and liveliness and the flavour is not pronounced enough. Subjectively, this cigarette gives less response than 23 T and 53 T.

Prototype 64 P : The taste direction is similar to that of 53 T, but slightly lighter in taste.

For a better evaluation of the qualities and regularity of the blended cut-fillers, it was necessary to determine additional parameters. This was done by considering the differences between the two cut-fillers and their common qualities.
Note that the results stated on the following table were obtained with the cut-fillers and not with tobacco reclaimed from cigarettes.

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CUT-FILLER COMBINATIONS		100 % (23 T)	75 % (23 T) 25 % (53 T)	50 % (23 T) 50 % (53 T)	25 % (23 T) 75 % (53 T)	100 % (53 T)			
PARAMETERS ANALYSED							(A)	(B)	(R)
PO_4	%	0.63	0.70	0.73	0.80	0.86	0.632	0.002	0.989
Glucose	%	3.53	3.19	2.56	2.54	2.23	3.460	- 0.013	0.931
Fructose	%	4.42	4.10	3.39	3.29	2.95	4.380	- 0.015	0.950
Invert sugars	%	7.95	7.29	5.95	5.83	5.18	7.840	- 0.028	0.942
Saccharose	%	1.29	1.51	1.69	2.16	2.51	1.214	0.012	0.969
Glycerine	%	0.02	0.40	0.63	0.98	1.10	0.078	0.011	0.977
Propylene glycol	%	0.07	0.28	0.46	0.72	0.93	0.060	0.009	0.997
Ash	%	13.3	14.2	13.9	13.8	13.5	14.22	- 0.006	0.924
pH		5.6	5.6	5.6	5.8	5.7			

By using the simple linear regression model : $Y = A + BX$

where : Y = the amounts in % of the analysed parameters of the various combinations.
X = the additions in % of the 100 % (53 T) filler to the various combinations.

the Intercept (A) and Slope (B) were obtained and the correlation coefficients (R) calculated as stated (see attached graphs).

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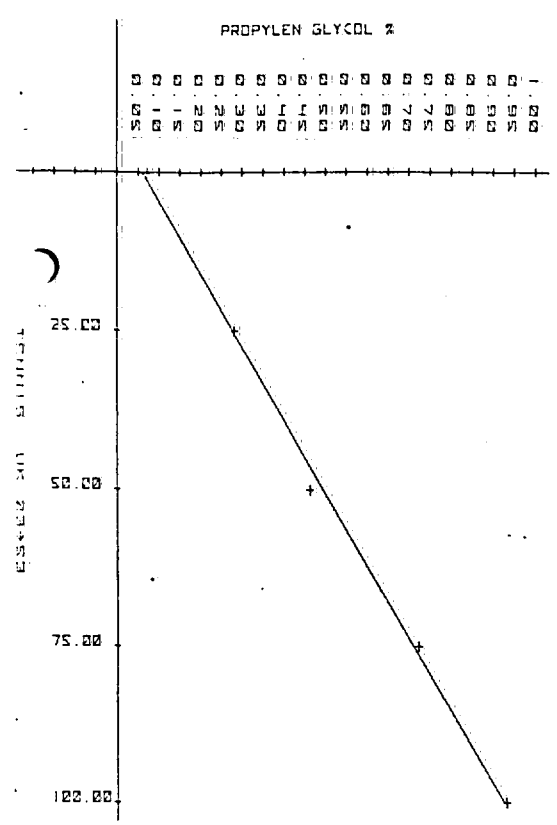
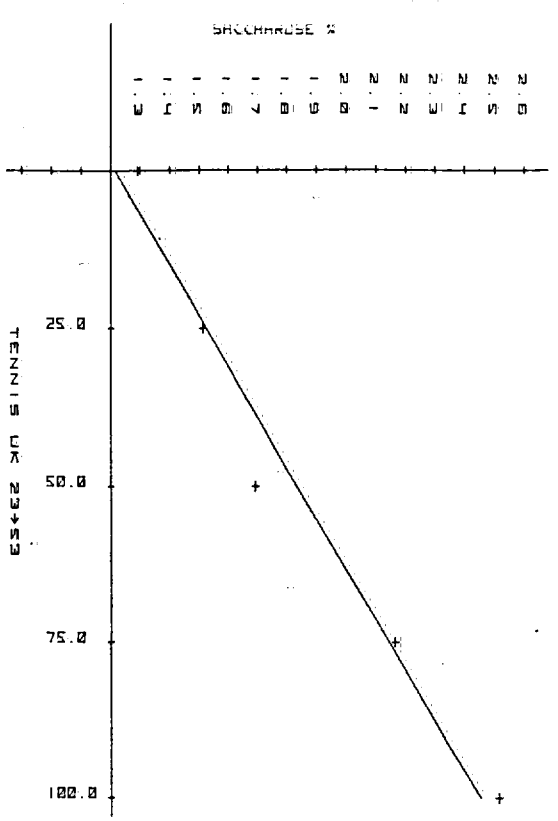
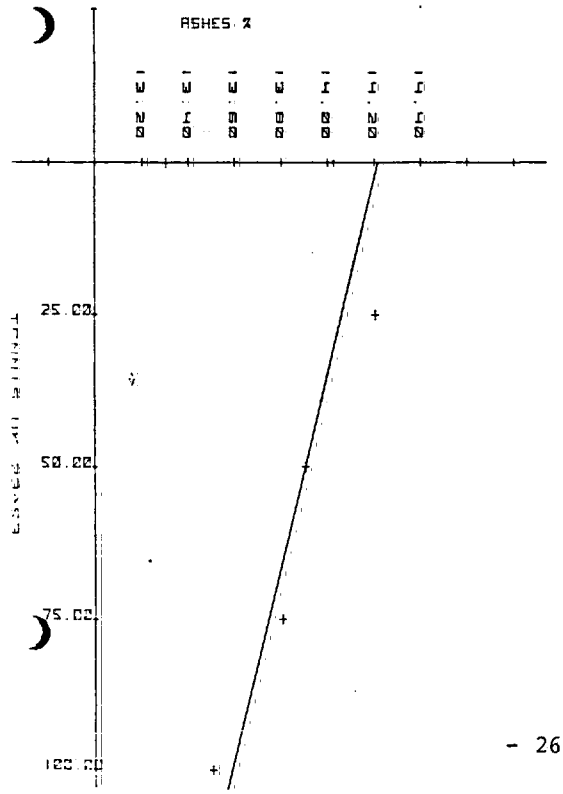
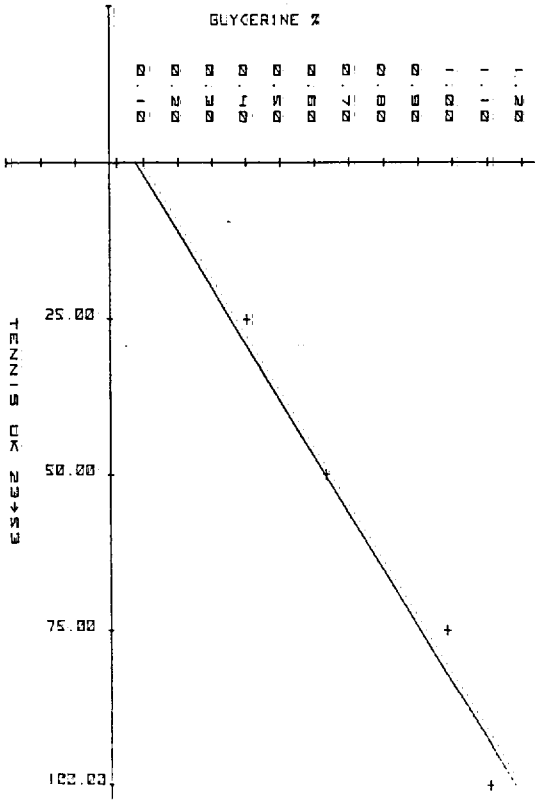
Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000









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Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000

Comments

The PO_4-content progressively increases in relation to the levels of the 100 % (53 T) filler added to the combinations. This is due to the fact that the 100 % (53 T) filler incorporates a high level of RL US in which the content of PO_4 is higher than that of the LTR UK present in the 100 % (23 T) filler.

Components		LTR UK	RL UK
Parameter PO_4	%	0.66	1.85

- The content of glucose and fructose (invert sugars) decreases in each of the combinations moving toward the final step 100 % (53 T). This is due to the increasing additions of the 100 % (53 T) filler which incorporates a high level of RL UK in which the content of invert sugars is ca. 50 % lower than that of the LTR UK present in the 100 % (23 T) filler.

Components		LTR UK	RL UK
Parameters analysed			
Glucose	%	2.33	1.75
Fructose	%	4.05	1.80
Invert sugars	%	6.38	3.55

- The saccharose-content increases with the increased inclusions of the 100 % (53 T) filler. This is probably due to the casings (sugar beet) and the better quality of tobacco grades used in the 100 % (53 T) filler.

- The content of propylene glycol and glycerine, both present in traces in the 100 % (23 T) filler due to the processing of the LTR UK, increases with the additions of the 100 % (53 T) filler which is fully cased.

- The ash-content slightly decreases when the levels of the 100 % (53 T) filler are increased. This is due to the better tobacco grades composing the 100 % (53 T) filler, which counteracts the high ash-content of the RL US present in the same cigarette.

Components	LTR UK	RL UK
Parameters analysed		
Ash %	14.2	15.3

- No significant changes may be seen in the pH combinations.

In general we can say that the blending of tobacco cut-fillers on a laboratory scale shows positive regularity. However, an industrial trial should be carried out before the potential of this blending process may be evaluated.

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Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000

208 TENNIS UK MIDDLE STEP

Objective

The development of intermediary products of progressive qualities which moves toward the Pan-European MARLBORO for the UK.

Descriptions of samples and results

For the objective, the Leaf experts (Lausanne) prepared and issued a new leaf formula filed under GB0120805N02. This blend was used for the preparation of a 1'000 kg batch under No 943, for which the Burley portion was cased and the PC solution added under industrial conditions while the AC solution was later applied to the cut-filler in the laboratory.
A larger portion of the cut-filler was set aside and then split into five aliquots of 20 kg each. Four of these aliquots were treated with AC solutions at different concentration levels while the fifth one, "untreated", represented the control. Five cigarette prototypes were produced and analysed. The results are shown in the table on the next page.

Comments

The described cigarette prototypes were submitted to Panel A (Lausanne) for organoleptic evaluation. All the trials were found to deliver a dry harsh taste, closed, not uniform and on the wild side. Such defects seemed to be partially counteracted by higher levels of AC applications. Based on this, TENNIS development will be continued by adjusting the casing of the Burley portion. In addition, due to the positive taste results obtained on MLF incorporating RL which by-passed the bright treatment, Panel A recommends using the same process for future TENNIS development.

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Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000

PROJECT NAME : T E N N I S - MIDDLE STEP PROJECT NO : 208 PROJECT LEADER : ANF DATE : 01.19.1982

PROTOTYPE NO		55 P	56 P	57 P	58 P	59 P
VERSION		A	B	C	D	E
AC APPLICATIONS	%	0	100	50	75	125
CIGARETTE CHARACTERISTICS						
Format	mm	7.95 / 20 / 84				
Total cigarette weight	mg/cig.	1069	1065	1053	1064	1063
Tobacco weight	mg/cig.	842	837	825	840	836
Filter RTD	mm WG	62	63	62	64	61
Total RTD	mm WG	106	110	109	110	107
Dilution	%	20	19	20	20	20
Filler density at 12 % M	mg/ml	258	261	257	260	258
Compressibility at 12 % M	mm	2.97	3.21	3.12	3.22	3.28
FILLER CHARACTERISTICS						
Total alcaloids	%	1.78	1.75	1.76	1.78	1.75
Reducing sugars	%	9.8	8.8	8.7	9.6	9.2
Nitrate-Nitrogen	%	0.19	0.22	0.22	0.20	0.21
SMOKE ANALYSES						
DPM	mg/cig.	14.7	15.2	16.0	15.0	15.3
TAR	mg/cig.	13.7	14.1	14.9	14.0	14.3
SN	mg/cig.	1.04	1.07	1.09	1.01	1.03
CO	mg/cig.	14.9	15.6	15.8	15.1	15.5
NO	mg/cig.	0.23	0.24	0.26	0.24	0.26
Puff count		9.5	9.3	9.3	9.4	9.5

COMMENTS :

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Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000

208 TENNIS 23 UK

This report summarizes the results obtained with TENNIS 23 UK produced at PMH for the UK market and those of the latest prototype of this cigarette produced at FTR.

Objective

The development of a diluted MARLBORO cigarette with Pan-European characteristics, by using a special flavour system on the tobacco only, thus eliminating the use of flavoured filters while conforming to the Hunter list.

Description of samples and results

Due to the very peculiar physical and organoleptic qualities detected in some of the cigarettes produced in November 1981 at PMH and released for the UK market, immediate action was taken by sampling cigarettes from the lot blocked in London. The collected samples were labelled according to the date of production then taken to FTR for complete evaluation.
A comparison of the physical and chemical data between TENNIS 23 UK produced at PMH and that produced at FTR is stated in the tables on the next pages.
Cigarettes of the same production day were also analysed after removal of the filter (plain) in order to determine the actual yield of TPM, H_2O and SN. These values are shown in brackets. In the tables of results, each figure represents the cross-mean-value of three production days of two shifts each at PMH, while the values under the heading "FTR" are single results of the very latest TENNIS 23 UK prototype produced at FTR.

Comments

On the basis of the above overall averages and their comparison with those of TENNIS 23 UK produced at FTR, we came to the conclusion that all the cigarettes produced at PMH, with the exception of the afternoon shift production on November 12, 1981, were within the acceptance limits. We only suggested a more intensive control upon parameters such as :
- Filter rod diameter and RTD
- Cigarette firmness and end stability
these being found to be the most fluctuating parameters in the product. In general there were no significant differences concerning the physical and chemical values between the cigarettes of the two production centres.

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Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000

Lausanne will issue their comments concerning the organoleptic qualities of the produced cigarettes.
Before re-starting production, we asked PMH, on December 14, 1981, to prepare a 3'000 kg-batch of tobacco blend TENNIS 23 UK. As soon as the cigarettes are produced, random samples will be taken and sent to FTR (R & D) for evaluation and the product should not be released until the full physical, chemical and organoleptic evaluations have been carried out and issued by FTR.

01.19.1982/ANF/cap

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Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000

Production dates
Nov. 6, 1981
Nov. 10, 1981
Nov. 11, 1981

PARAMETERS ANALYSED		Min. values	Max. values	$\bar{X}$	S	" F T R "
CUT-FILLER						
TA	%	1.85	1.99	1.94	0.05	1.83
RS	%	8.7	9.9	9.3	0.44	8.5
$N\text{-}NO_3$	%	0.14	0.19	0.17	0.02	0.16
Filler density at 12 % M	mg/cig.	248	251	249	1.17	240
PICKING						
LEAF	%	71	78	74.5	2.43	75
VEINS	%	6	10	8.7	1.51	10
ES	%	5	7	6.3	0.82	5
LTR	%	8	15	10.5	2.35	10
FILTER						
Single denier		3.9	4.2	4.1	0.13	3.8
Section		I	I	I		I
Plasticizer	%	5.2	7.5	6.5	0.77	6.0
Efficiency	%	40	43	41.3	1.21	39
RTD	mm WG	58	69	64	3.83	61
CIGARETTE						
Total weight	mg/cig.	1008	1017	1014	3.43	983
Tobacco weight	mg/cig.	780	788	785	2.99	763
Paper porosity	$ml/cm^2/min.$	42.5	45.5	43.6	1.20	49
Dilution	%	8	11	9.7	1.21	11
Total RTD	mm WG	102	111	108	3.31	101
Compressibility at 12 % M	mm	3.40	3.76	3.57	0.12	3.46
SMOKE						
TPM	mg/cig.	17.3 (34.7)	18.5 (37.2)	17.95 (35.73)	0.48 (1.11)	17.6 (35.5)
H_2O	mg/cig.	1.3 (6.1)	1.6 (7.6)	1.45 (6.67)	0.10 (0.55)	1.6 (6.8)
DPM	mg/cig.	16.0 (28.2)	17.0 (30.1)	16.5 (29.05)	0.48 (0.72)	16.0 (28.7)
SN	mg/cig.	1.20 (1.95)	1.38 (2.19)	1.28 (2.08)	0.07 (0.09)	1.21 (2.02)
TAR UK	mg/cig.	15.1	16.0	15.6	0.43	15.1
CO	mg/cig.	13.2	14.4	13.9	0.46	13.5
NO	mg/cig.	0.16	0.19	0.18	0.01	0.17
Puff count		8.6	8.8	8.7	0.10	8.1

Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000

Production dates
Nov. 12, 1981
Nov. 13, 1981
Nov. 16, 1981

PARAMETERS ANALYSED		Min. values	Max. values	$\bar{X}$	S	" F T R "
CUT-FILLER						
TA	%	1.90	2.04	1.95	0.05	1.83
RS	%	8.9	9.8	9.4	0.34	8.5
N-NO_3	%	0.16	0.19	0.17	0.01	0.16
Filler density at 12 % M	mg/cig.	247	250	248	1.10	240
PICKING						
LEAF	%	73	80	76.8	2.86	75
VEINS	%	5	10	8	2.12	10
ES	%	3	8	6.2	2.05	5
LTR	%	7	9	9	1.87	10
FILTER						
Single denier		3.8	4.2	3.9	0.15	3.8
Section		I	I	I		I
Plasticizer	%	6.1	7.5	6.9	0.52	6.0
Efficiency	%	39	42	41	1.41	39
RTD	mm WG	64	69	66	3.9	61
CIGARETTE						
Total weight	mg/cig.	1009	1018	1013	4.55	983
Tobacco weight	mg/cig.	782	790	785	4.44	763
Paper porosity	$ml/cm^2/min.$	41.5	49	45	2.81	49
Dilution	%	9	10	10	0.45	11
Total RTD	mm WG	101	117	110	6.24	101
Compressibility at 12 % M	mm	3.49	3.80	3.71	0.13	3.46
SMOKE						
TPM	mg/cig.	16.5 (34.2)	18.3 (35.5)	17.2 (34.98)	0.72 (0.48)	17.6 (35.5)
H_2O	mg/cig.	1.2 (5.9)	1.5 (6.5)	1.36 (6.22)	0.11 (0.22)	1.6 (6.8)
DPM	mg/cig.	15.3 (28)	16.8 (29.2)	15.8 (28.76)	0.61 (0.47)	16.0 (28.7)
SN	mg/cig.	1.17 (1.99)	1.29 (2.16)	1.22 (2.05)	0.49 (0.67)	1.21 (2.02)
TAR UK	mg/cig.	14.4	15.9	14.9	0.61	15.1
CO	mg/cig.	13.8	14.4	14.0	0.24	13.5
NO	mg/cig.	0.18	0.19	0.18	0.00	0.17
Puff count		8.3		8.6	0.26	8.1

Source: https://www.industrydocuments.ucsf.edu/docs/pfxk0000